This may be clearly seen by a reference to Fig. 2, in which is given the orifice at the highest portion of the roof of the kiln having an area «, such that the lower free surface of the layer of kerosene in the model has become stationary at a distance H below the smoke hole or orifice.

It is evidently desirable that the values of the coefficients KI and *2 should be determined in order that they may be used in the equation (B). The values of Q, o> and h may be determined experimentally. Unfortunately this has not been done up to the present.

For gases, in the case of comparatively large orifices, these coefficients will probably approximate unity. This is the value which has been assigned to these coefficients for the purpose of solving the problems presented in this work.

The case shown in Fig. 2 may be especially called to the attention of those who are operating reverberatory furnaces. The author had the opportunity to verify this in the works of Korniloff Brothers, at Petrograd, accompanied by Professor J. G. Yesmann.W In the second story of the porcelain kiln (Fig. 85, page 114) where the waste gases passed out through the roof, the lower free surface of the gases was clearly seen at a height of from 1 to If meters above the hearth of the kiln. This lower free surface of the layer of gases evidently might be forced down as far as the hearth of the upper chamber by the obstructing of the smoke hole in the roof of the kiln, as with the experimental models which have been shown.

When the lower free surface of the layer of gases is brought down into contact with the hearth of the kiln, it gives the nearest approach to a uniform burn that it is possible to obtain with a furnace operating in this manner, which is old and irrational.

Complete regularity of the burn cannot be attained, as has been shown, except by the use of the downdraft system

(Fig. 4).

Getting rid of the waste gases of combustion by means of an opening in the highest part of the furnace was a method very much in favor in former times ;<2> but in later furnaces this method has been completely supersede*!. However, an example is given

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[Refer to p. 153 and following.

(2) Updraft furnaces are frequently employed in the manufacture and smelting of copper, lead, and certain other metals.